Vermont Farm Methane Project Quarterly Report

Prepared by: Jeffrey W. Forward and Dan Scruton **April 10, 2002**

Introduction:

The Vermont Department of Public Service (DPS) and the Vermont Department of Agriculture (AGR) have received a total of $695,000 from appropriations from the federal budget over the past several years to promote the use of methane recovery technology on Vermont dairy farms. This technology has the potential to help farmers with their nutrient management plans and at the same time provide additional on-farm income. The goal of this project is to identify and help overcome key strategic hurdles to widespread adoption of methane recovery technologies by Vermont farmers.

The project was designed to consider methane recovery in a broad context, taking into account its potential benefits as a component of a comprehensive nutrient management system, as a renewable energy source and as a strategy for greenhouse gas reduction. The implementation plan calls for using one third of the money for project administration and outreach, one third toward research and development and one third to be used for cost share of installations.

PROJECT ACTIVITIES January 1, 2002 - March 31, 2002

ORGANIZATIONAL:

Biomass Energy Resource Center, Inc.

The Vermont Methane Project established a part time staff position at the Biomass Energy Resource Center (BERC) that will be specifically devoted to this project. BERC is a not-for-profit private corporation with the mission of promoting and developing biomass energy projects. This is a project oriented organization that hopes to work on biomass projects in Vermont, the Northeast and globally. Vermont has considerable experience in small and medium scale biomass projects and the goal of this organization is to export that expertise by facilitating specific projects.

Project Advisory Committee:

We do not plan to schedule a Project Advisory Committee meeting until after the legislative session which won't end until the end of May or early June. At that time we will re-evaluate our outreach strategy and adjust it as need be based on the outcome of the Renewable Energy Bill.

Welcome:

The project has hired to college interns. Brian Walden is an environmental sciences student at UVM and will be working with Dan on farm related issues. He is currently doing a literature search to update the

report Dan wrote at the onset of the project and compiling all of the data gathered at Fosters.

RESEARCH AND DEVELOPMENT

Foster Bros. Dairy Farm research and demonstration site:

Foster Bros. have a two chambered side-by-side digester that they have been using successfully for over 15 years. The Vermont Methane Project has isolated these into two separate digesters so that we can experiment with various materials and technologies and still maintain a control that we know works. Fosters began loading the digester in December of 2000 and has been producing biogas generated electricity since January 2001.

This next quarter we will conduct a retention time study. Under the direction of Stan Weeks and Dan Scruton, Fosters are going to increase the feed rate to one side of the digester until we are at a 10 day retention time and compare gas output. If we are successful, and double the volume of gas from the side we are feeding, it will mean the steam injection systems developed by this project can reduce the initial cost of a digester and allow for a more automated system without the need to go to thermophilic.

Feasibility Studies / Inquiry follow-ups:

We are delaying any more engineering design work on the 800 cow farm we have been working with pending the outcome of the Renewable Energy Bill. If that bill were to pass, it would change the size of the generation equipment we would recommend.

We are working on an engineering proposal for a 600 cow farm in Franklin county that has expressed a strong interest in the technology. This will probably be a whole manure plug flow system.

We have also had many preliminary contacts with a variety of farms and potential sites for anaerobic digesters. These contacts include:

- We have had four new farm evaluation requests this quarter and Dan has been to three of the farms and plan on visiting the fourth in the next couple of weeks. Three of these were in Franklin County, and one in Orleans County.
- We have a potential cooperative site location and will be following up with those farms to see if it is worth a feasibility study.
- We have preliminarly agreed to co-fund ($2500) a feasibility study on a digester for Ag by-products and are working out the details of that project.
- We are continuing to work with a 100 cow farm in southern Vermont that is interested in addressing its nutrient management issues and very much wants to consider including anaerobic digestion in its plan. This may be a particularly attractive demonstration site since it is located in southern Vermont with easy access and the organization that owns the farm has already established the farm as a demonstration farm to some degree.

- An engineering firm that specializes in combined heat and power installations is developing a farm based biogas energy system that would use the bulk of the gas in an adsorption chiller to meet the cooling load on a farm. We are helping this firm consider products and/or services that might be cost effective and attractive to the farm market.

POLICY INITIATIVES:

S. 264 Renewable Energy Bill

The Vermont legislature is considering a bill to promote the development and use of renewable energy technologies. The bill has the following features:

- Creates a Renewable Energy Portfolio Standard (RPS) to require utilities to increase the amount of renewable energy they provide to their customers.

- Releases $750,000 from the Petroleum Overcharge Escrow Account to create a renewable energy incentive program to help businesses and homeowners buy solar and wind energy systems

- Allows groups of utility customers to "group net meter". This provision is particularly helpful for dairy farmers looking to invest in a methane collection system as they could maximize generation capacity based on the manure resources available (up to 150 kW) and utilize that power in the milking facility and as many other barns, houses and buildings as the system could effectively supply.

- Eliminates the sales tax for solar hot water systems and for off-grid installations of solar and wind electric systems (currently the proposed exemption is for net metering systems, grid tied solar and wind only).

- Creates rules for utility "green pricing" programs to allow ratepayers to voluntarily pay a little bit more on their electric bill to increase the amount of renewable energy their utility buys

- Creates an alternative system for regulating the utilities to allow them more flexibility and the ability to earn a profit based on performance and other criteria and not just on the amount of electricity sold.

A number of these provisions could significantly impact the acceptance of anaerobic digestion technology by Vermont farmers. The Vermont Methane Project managers have made themselves available to legislators to answer questions regarding the impact this bill would have on farmers. The bill passed the full Senate on March 28 by a 27 - 1 vote. It will now move on to the House. Attached is a copy of the bill as it passed the Senate.

Emissions Trading and "Green Tags":

Green Tags is a notion where the environmental benefits of a particular generation source are marketed to consumers for a premium. In this case, farm based methane might offset conventional generation sources with their associated environmental impacts as well as reduce the amount of methane released in the atmosphere. Since naturally occurring methane is a significant greenhouse gas, using that gas could have a significant environmental benefit. Native Energy, Inc. is a company that markets green tags throughout the US. They have expressed interest in negotiating a contract with to purchase these credits from a farm and sell these environmental benefits to consumers through these "Green Tags". The Vermont Methane Project is continuing to explore the risks and benefits of such a strategy from the producers perspective, but we have put off making any firm commitments with Native Energy until we see what happens with the Renewable Energy Bill that is in the legislature. If that bill were to pass, it will change the economics of anaerobic digestion significantly. We would not want any farmer to tie up the environmental benefits of anaerobic digestion through any contractual agreement until we know the fate of that bill.

OUTREACH:

Tours:

One of the benefits of setting up our research project at Foster Brothers Farm in Middlebury is that it is an excellent demonstration site. The Fosters have nearly 20 years of experience with this technology and related systems and they are very excited about some of the experiments we are performing there. These tours allow us to display some of our experimental technologies and it gives us a good opportunity to discuss with other individuals, groups and organizations possibilities for collaboration.

- On February 15, we conducted a tour of the Foster Bros. farm for Joe Broyles who is with the New Hampshire Energy Office. Several UVM students also tagged along for the ride. Mr. Broyles was very interested and will continue to watch our progress to see how our work might apply to NH farmers.

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Attachments:

- S. 264, Renewable Energy Bill as passed by VT Senate, March 27, 2002
- March 29, 2002 Free Press Article on the Renewable Energy Bill